

The Mining Journal

LONDON, AUGUST 7, 1959

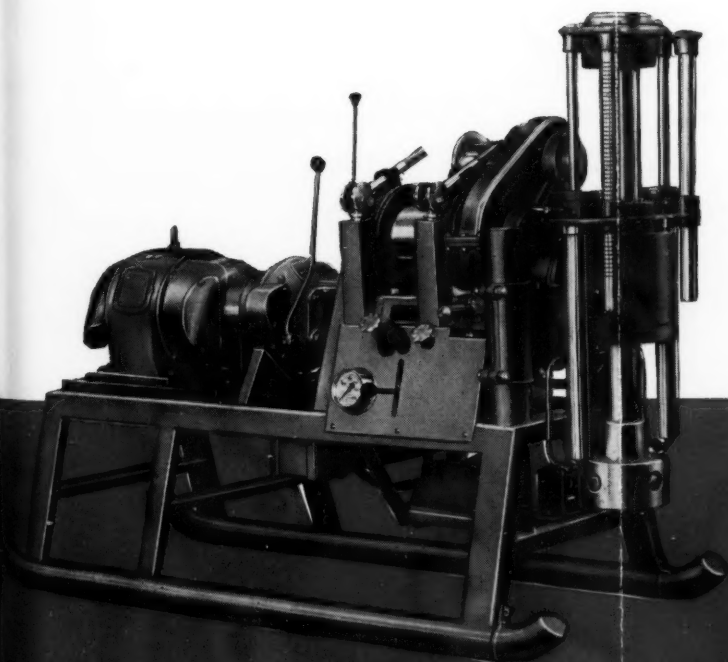
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Aid for the "Have Not" Nations

IT is becoming increasingly difficult to keep track of the ever-growing number of organisations through which aid to the peoples of underdeveloped countries is now being channelled, and to view clearly and in perspective the multifarious facets of this greatest of all world problems. Particularly valuable, therefore, is the concise and comprehensive picture which has emerged from the recent House of Commons Debate in Committee of Supply on the subject of underdeveloped areas.

The essence of the problem, as Mr. Noel-Baker sees it, is that in what we call the advanced countries, 400,000,000 human beings live in comparative affluence today, while 1,000,000,000, perhaps more, live in conditions which we find it hard even to understand. The income per head in the U.S. is more than \$2,100 a year. In 60 of the 83 countries which are members of the United Nations, the average income per head is about \$120. In Ceylon it is \$110 a year, in Pakistan \$70, in India \$60, and in Burma \$48. The really terrifying thing is that the gap between the "haves" and the "have-nots" is still increasing. We are growing richer but many of the poor, thanks to population pressures, are growing poorer still. In the West we invest an average of £30 per head per annum for new plant and machinery to make us richer. The "have-nots" have £30 a year or less on which to live.

Since 1945, there has been a double revolution in the underdeveloped countries — a revolt against the colonialism of the past, and a revolt against the indigence, the ignorance, and the suffering of the past. The still widening gap between their standards and ours make that double revolt potentially a most explosive force.

As Mr. Noel-Baker put it, we in Britain have a grave responsibility in this matter. We were the greatest of the colonial powers — we ruled nearly one-quarter of mankind — and we have a major interest as importers of the primary products which they produce and as exporters of the manufactured goods which they require. Two-thirds of all our exports go to the countries from which the primary products come.

Rapid expansion has meant that we have imported more, and this has meant higher prices and a threat to our trade balance. On the other hand, if we indulge in deflation in order to keep our imports within bounds, we cause a depression in the primary producing countries. Quoting from the United Nations Economic Survey, Mr. Biggs-Davison said that the fall in raw material prices cost the primary producing countries \$2,000,000,000, which is six times what was lent them by the World Bank. On the other hand, as the Economic Secretary to the Treasury, Mr. F. J. Errol, put it, an economically weak Britain would be in no position to help other countries, while lack of world confidence in the £ sterling would damage world trade, and the producers of primary products — often the principal output of underdeveloped countries — would be the first to suffer. In discussing this aspect of the problem reference was made by Sir John Barlow, among

others, to the Grondona scheme for the stabilisation of produce prices in different parts of the world.

As was to be expected, contributions to the debate revealed a considerable divergence of opinion between the two major political parties as to the respective roles of Government and private enterprise in the development of emerging territories, but there was a common preference for multilateral programmes as opposed to bilateral agreements, the latter being generally regarded as not always in the best economic interests of the countries concerned. It was further stated that frequently a loan without strings can achieve a political aim much better than the other type of loan.

Whatever the means adopted the resources available are strictly limited. Hence a choice between desirable objectives must be made, and if so the development of wealth-creating resources in these countries must come first. Mining is thus of key importance in raising the living standards of the "have-not" countries. There is nevertheless some substance in Mr. Leslie Hale's allegation that the American industrial machine, and, to a lesser degree, our own, is demanding a larger and larger share of essential raw materials from all the world, and that this operation will, naturally, increase the poverty of the rest of the world, unless there is planning and organization. The truth of the matter is, of course, that Western technology is creating new sources of wealth from deposits which have been dormant for centuries and which otherwise might have remained so for the rest of time. Furthermore, minerals only become economically valuable when they can find markets, and at the present time, generally speaking, it is only in the industrial countries that markets can be found. This situation is changing as rapidly as the underdeveloped countries can establish industries of their own. For this purpose, as Mr. Noel-Baker pointed out, they need technical assistance, the help of foreign experts in training their own technicians, and grants-in-aid for many purposes. Here, clearly, is a field in which our own mining consultants, with adequate government backing, could play a fruitful part.

As to Britain's own contributions to the assistance of underdeveloped areas, Mr. Errol stated that the total of U.K. Government aid in 1958-59, excluding military aid, was about £115,000,000, representing an increase of over £35,000,000 compared with the previous year, and that under existing commitments, the total would rise substantially again in 1959-60. Private U.K. investment overseas totalled about £200,000,000 to all countries, of which about half went to underdeveloped countries. At about £215,000,000, Britain's total aid to underdeveloped countries represents rather more than 1 per cent of the average gross national product of the U.K. in recent years.

The salient impressions arising from this most interesting debate are that Members on both sides would like to see additional aid provided by the U.K. Government for the underdeveloped countries, but that we cannot go it alone without over-straining the economy. In stressing the necessity for other countries to join in, Mr. Erroll referred to a resolution in favour of partnership to assist the underdeveloped countries, which was passed at the Atlantic Congress held recently in London. Resolution D, as it is termed, urges a "massive and sustained effort" aimed at "helping the peoples of the less-developed countries to achieve a rising standard of living together with individual freedom, human dignity, and democratic institutions".

The objective could scarcely have been more aptly expressed. Its achievement presents problems of truly formidable magnitude, which can only be overcome by the most effective utilization of all available financial and technical resources. This calls for very careful study.

FOREIGN INVESTMENT IN SPAIN

Under a new investment ruling, foreign interests who invest in Spanish companies will be able freely to transfer abroad any profits resulting from their investments. The proviso is that their capital must be officially designated as being in the "preferential economic and social interest" class. The transfer abroad, in foreign currency, of capital invested in this class may be initiated by the parties concerned two years after such capital entered the country and may be effected during the following two years.

The decree stipulates that Spanish nationals residing abroad and foreign nationals may transfer to Spain capital in foreign currency, for investment in the modernisation, expansion or creation of Spanish companies. Such investors would be accorded the same rights as Spanish nationals resident in Spain. Where special provisions are not already in force, mining companies will be subject to the new regulations. The government is authorized under the decree to "improve" these transfer regulations when the balance of payments and foreign trade position permits.

The Spanish Government Information Bureau has set up an office to advise on foreign capital investment in Spain. The Bureau will advise on both legal and technical matters and will give prospective investors details of energy availability, the raw material situation, labour and communications.

It is also noteworthy that the new customs import tariffs which took effect on August 1 generally favour raw materials and hit at manufactured goods which Spain produces. Copper, which is among the liberalized mineral ores, will pay more duties. Copper blister, for instance, is now rated at 52.20 gold pesetas per 100 kg. as against 31.12.

IRON ORE IN ARCTIC SWEDEN

Speaking at a recent Norrlandsmassan conference held at Skelleftea, in North Sweden, envoy Arne S. Lundberg, managing director of the LKAB Mining Co. stated that the deposits of iron ore in Arctic Sweden were estimated to amount to at least 31,000,000,000 tonnes, and that it would be possible to increase the annual output from that source from the present 14,000,000-15,000,000 tonnes to 22,000,000-23,000,000 tonnes by the late 1960's. Such an increase would be dependent, however, on the state of the export market, and would necessitate expansion of the existing capacity of the railways and ports.

Current extension schemes, it was added, would raise LKAB's output by 1963 to about 20,000,000 tonnes, of which the Kiruna mine alone would provide 14,000,000 tonnes. The reserves at their disposal, apart from those at Kiruna and Malmberget, had been estimated at 600,000,000 tonnes, but it was probable that this estimate was substantially on the low side. A further increase in mining would necessitate heavy investment, however, and when it was taken in account that annual investments of the order of 50,000,000 were required for an output of 17,000,000-18,000,000 tonnes, it would be appreciated that a sizable increase of output would require at least twice that figure.

As regards railways and ports, Mr. Lundberg stated that the capacity of the line between the company's mines and the port of Lulea, on the Gulf of Bothnia, could be increased to 8,000,000 tonnes annually by an investment of 20,000,000 kronor, but that further investment would then become necessary in the port, since its present capacity is only 4,500,000-5,000,000 tonnes. The line from Kiruna to Narvik would be working to capacity in the first half of the 1960's.

Steep Rock Lake Dredging Prepares for Iron Ore Mining

By JOHN GRINDROD

NEW hydraulic techniques being applied by Caland Ore Co. Ltd. at Steep Rock Lake in Ontario, Canada, are making possible the removal of silt and mud from the bed of the lake in preparation for iron ore mining operations which are eventually expected to provide 3,000,000 tons of ore a year.

Until a few years ago, the tremendous engineering problems and the costs involved in development work precluded the exploration of such submarine deposits. In spite of the fact that some \$60,000,000 is expected to be spent on uncovering the Steep Rock Lake deposits by dredging methods, the mechanical removal of the same amount of material would have been much more costly. The solid rock at the lakeside has reduced the need for careful terracing to protect the mining pit from mud slides. Following the removal of the lake bottom material, the iron ore will be mined by conventional opencast and underground methods.

Development of the Steep Rock iron range was begun at the height of the wartime demand for minerals in 1943 and it was to this area that Inland Steel Co. U.S., later turned in their search for additional reserves of ore. An option agreement was signed between Caland Ore Co. Ltd., a wholly-owned subsidiary of Inland Steel, and Steep Rock Iron Mines Ltd. in 1949 and between 1949 and 1953 a number of drilling surveys were carried out. On the results of these drilling programmes, Caland negotiated a long-term lease, on a royalty basis, with Steep Rock Iron Mines for ground in the east arm of Steep Rock Lake covering 1,249 acres. Under the terms of the lease, ore production was to begin in 1960 and was to work up to the full production of 3,000,000 tons a year by 1969.

Development for production from the "C" orebody located in Falls Bay of the Steep Rock Lake was begun in 1953 with the letting of the contract to Construction Aggregates Corp., U.S., for the dredging of the lake bottom, such contract specifying a two-stage programme covering

first the construction of dredging equipment and plant and then the actual dredging of the lake.

Prior to the beginning of the dredging operations the water level at Steep Rock Lake was 1,120 ft. above sea level. The ore level varied between 600 ft. and 1,000 ft. above sea level leaving a bed of silt between 50 ft. and 400 ft. in thickness and water to a depth of 150 ft. The plan of operation envisaged the removal of the dredged material to a disposal area $4\frac{1}{2}$ miles away in the Marmion Lake. There, the silt would settle out and the water find its way back via the North and South Twin Lakes, in a closed circuit, to Steep Rock Lake to be reused for the removal of silt. It has been estimated that the water in the lake will have been pumped out nine times before the iron ore is finally laid bare.

In order to create this hydraulic arrangement several water diversions and controls had to be constructed to form a storage basin for the dredged material and to control the water flowing into Falls Bay. Three earth dams were built at the north end of Marmion Lake to prevent lake water from flowing into the Seine River. At the same time, a water control works was built between Marmion Lake and North Twin Lake to regulate recharge water and a channel was blasted between North Twin Lake and South Twin Lake. At the bottom of South Twin Lake, the Grossman Dam, a concrete structure, has been built to provide close control of the dredge recharge water. Later, it will impound and reverse the flow of the runoff in the Twin Lakes drainage basin.

These control works were completed in 1955 and by the spring of that year actual dredging of the lake bottom was begun. The yearly quantity of material removed since the start of dredging is:

Year	Cu. Yds.
1955	16,508,050
1956	39,600,530
1957	37,478,500
1958	35,029,900

Total to 30/4/59 approximately 139,000,000

Immediately below is the Lime Point opencast stripping operation, seen in centre background of illustration. Conveyor system is shown. The illustration at right, below, depicts the Falls Point mine headframe. Portal of underground conveyor tunnel is seen at extreme right foreground



The target set for April 30, 1959, was 136,200,000 cu. yds. so that at that date, work was slightly ahead of schedule. It was initially expected, that the total quantity of material to be removed would be about 160,000,000 cu. yds. and that dredging would be completed by mid-November 1959. It has since been determined, however, that the quantity of silt to be removed will be somewhat in excess of 160,000,000 cu. yds. This means that the dredging period will be extended into early 1960.

Each of the two identical dredges are assisted by a floating booster station and a shore booster and all the pumps are electrically powered by 10,000 h.p. motors. To provide the electric power a transformer station was constructed at Falls Bay and a 115 kV transmission line installed. A monitor barge is used for washing down material to be dredged and pumped through the hydraulic system. Of this system, the dredge pump is the No. 1 control and the floating booster the No. 2 control, and starting up of the dredging operation has to be carried out in this order of precedence. Thus, the dredge pump is first primed and gradually brought up to its full speed of 350 r.p.m. to 355 r.p.m., during which time the vacuum pressure increases from 0 to 15 in. of mercury and the discharge pressure from 0 lb. to 130 lb. or 135 lb. At the same time, the inlet water pressure to the floating booster increases and when it reaches 90 lb. the floating booster is started, to be gradually brought up to 350 r.p.m. to 355 r.p.m., when the inlet pressure is about 50 lb. and the discharge pressure about 200 lb. The shore booster is then put on the line, being gradually brought up to its full speed of 350 r.p.m. to 355 r.p.m. to work under an inlet pressure of 70 lb. to 120 lb. and a discharge pressure of 220 lb. to 270 lb.

Automatic Speed Regulation

Should the pressure be suddenly raised or lowered, electrical controls on the floating and shore boosters ensure that the speeds of the motors are automatically regulated accordingly, thus reducing the dangers of cavitation or pumping dry. When the dredge pump is at normal pressure its speed will become normal and the speeds of the floating and shore boosters, in turn, will be automatically adjusted to normal.

When all the units are on line and pumping, the dredge cutter at the end of a 74 ft. long ladder is lowered into the lake bed by block and cable to churn up the bottom material directly in front of the open end of the 36 in. suction pipe. The cutter is driven by a 1,000 h.p., 600 r.p.m. motor, which normally turns at about 554.4 r.p.m. and through a reduction gear of 30.8 : 1 gives a normal cutter speed of 18 r.p.m.

Drawn up by pump suction, the dredged material passes through the suction pipe in the lower portion of the dredge ladder and thence to the pipeline to the dredge hull, which is connected to the suction pipe by a very heavy, above water, flexible coupling. Thence, the spoil, including boulders up to about 21 in. diameter, is passed under pressure to the back of the dredge, through a swivel coupling to the 36 in. floating pontoon pipeline. The floating booster, in turn, relays the pumped material to the shore booster which again sends it forward to the Marmion Lake disposal area through the shore 42 in. pipeline.

Should a silt slide occur, burying the cutter and suction pipe, protection is given to the pump and against solids building up in the line by a vacuum valve placed in the suction line about 45 ft. behind the cutter. This opens under extreme vacuum, permitting water to pass through the pump. A rock box is also installed on the intake side of each pump by means of which any obstacles can be

removed and also by way of which the pump and impeller can be inspected. The latter has four vanes and is 96 in. in diameter and 22 in. from front to back shrouds, being direct-driven by the 10,000 h.p. motor.

Shutting down dredging operations is also effected gradually to a set procedure and correct order of precedence, after all the stations have been warned by radio. Dredge pump, floating booster and shore booster in turn slow down to about 250 r.p.m. till the flap valve in the pipe between the floating and shore boosters first begins to flutter between the open and closed position and then to reach an almost closed position. The booster is then taken out of the line and the valve allowed gently to close fully under notification to the floating booster. The pump at the floating booster is similarly taken out of the line and this is followed by the dredge pump. When all three units have ceased operating the line is full of water but held by the flap valves located on the discharge side of the various pumps. Line drainage can be effected by means of 6 in. valves located in front of the flap valves, while a pop-off valve at the floating booster will give more rapid draining between floating and shore boosters.

Opencast Mining

Under good operating conditions in silt without too much gravel, the 42 in. shore pipeline is kept full, the flow being approximately 21 ft. per sec., and the solids range up to 21 per cent. This yields a throughput of 5,450 cu. yds. per hour through the 22,325 ft. long pipeline.

Initially, opencast mining will be done at the north end of the orebody. Contracts have been awarded to extend the pit access road to the area and to cut the highest benches in rock to the north of the ore limits. During 1958, 240,000 cu. yds. of earth and 72,000 cu. yds. of rock were removed during the benching operation.

A three-flight, 5,000 ft. belt conveyor system to carry the ore from the pit area to the railway loading point has been constructed and placed in operating condition. This system has a capacity of 1,000 l. tons per hour and a vertical lift of 495 ft. At the pit end of the conveyor an excavation has been made in rock to house a truck dump, crusher and belt feeder. It was intended to install the equipment in the crusher station before the resumption of stripping operations in 1959.

Underground Mining

Preparations for underground mining are also being pushed ahead. Near the southerly section of the orebody, the Falls Point shaft has been completed by a contractor at a depth of 1,334 ft. A pumping station has been established at the 1,200 ft. level and four 1,250 U.S. g.p.m. pumps installed.

On the surface, the construction of a headframe and service building has been started and was nearing completion at the end of 1958. Three friction hoists and two 4,000 c.f.m. compressors had been delivered to the property for installation on completion of the building. The shaft capacity is rated at 1,500,000 tons p.a.

The construction of a four-mile spur line connecting the plant area with the Steep Rock spur has been started by the Canadian National Railways, and completion is scheduled for 1959. A screening and loading plant, located at the junction of the railway and the upper end of the pit conveyor, has also been started and this, too, is due for completion this year.

MINING MISCELLANY

The Norwegian Government is continuing its exploration of the copper ore deposits at Kautokeino in northern Norway. This year a series of diamond drill holes will be bored to a depth of 300 ms. and it is hoped that this will lead to a considerable increase in the ore reserves, at present estimated at 2,000,000 - 3,000,000 tonnes. A neighbouring ore field will also be investigated and 8,000 sq. km. of the surrounding area will be aerially mapped and in part magnetically and electro-magnetically prospected.

Tombill Gold Mines took a further step towards becoming the first Canadian-controlled company to produce potash in Canada, when it was decided to exercise an option on 122,883 acres in Saskatchewan and Manitoba covering a deposit estimated to contain 1,000,000,000 tons. The project has the backing of a strong Canadian group.

According to the latest published figures, hard coal production per shift in the Ruhr coalfields reach an overall average of 1,783 kg. during the current year. This compares with 1,633 kg. in 1958 and 1,367 kg. in 1949.

Mr. K. D. Malaviya, India's Minister for Mines and oil, has announced that detailed prospecting of the Panna diamond mines will shortly be started. Mr. Malaviya has also reported the discovery of a new coal seam in Madhya Pradesh — described as an entirely new find — which might yield exploitable reserves exceeding 50 million tons.

A Rs.70,000,000 project to "revolutionise" the coal mining industry in West

Among the A.E.I. exhibits at the Mining Machinery Exhibition was this 14-ton Type DBF/12 storage battery locomotive, one of six for the Bilston Glen Colliery, Scottish Division, N.C.B.

Pakistan will shortly be launched by the Pakistan Industrial Development Corporation, it has been announced. Meanwhile, large-scale geological operations are being carried out in Baluchistan, where there is reported to be a coal-bearing area of considerable magnitude.

Blasting at stone quarries and other mining operations is to be studied by the Bureau of Mines, U.S. Department of the Interior, as part of intensified research on such vibrations and their effect on buildings, dams and similar structures.

It has been officially announced that the Krupp team of experts who recently completed a survey of iron ore resources has discovered a deposit estimated to contain 5,000,000 tons in Kanchanaburi Province, Thailand.

The French Government is reported to have decided that preparations for the construction of a 600,000 tonnes per annum steel plant in the Algerian port of Bone are to be speeded up, with the objective of starting steel production at the beginning of 1962. It is understood that there have been considerable delays in the scheme because of disagreement between the steel industry and the Finance Ministry over financing the plan. All differences are now reported to have been straightened out. The Bone plant would use the natural gas of the Sahara for both power and reducing iron ores. The ores would be supplied by the Algerian mines of Ouenza.

According to a statement issued by the Hungarian Government, by the use of a new gallium-from-bauxite process

developed by the Hungarian Metal Research Institute, it has been possible to obtain gallium of 99.99 per cent purity, and a production plant has been set up for output of the metal by this process. At first the plant, to be run on experimental lines, will turn out enough gallium to meet the total inland demand for the metal: on extension of the unit Hungary will become an exporting country.

Unusual metals needed for expanding uses in the high-temperature, electronic, nuclear-energy, thermoelectric and astronautical fields will receive increased attention in the research programmes of the U.S. Bureau of Mines for the 1960 fiscal year, which began on July 1. During the next 12 months the Bureau will complete an investigation of domestic sources of caesium and rubidium and will begin research to develop a simple field test for these elements. Complementary mineral-dressing, extraction, separation and reduction studies are also being undertaken. In addition, the Bureau is seeking processes for recovering rhenium by direct extraction from molybdenite concentrates and from other promising sources.

The Portuguese Ministry of Economy has appointed a commission to investigate problems connected with the installation of an iron and steel industry in northern Portugal under the present Development Plan. The proposed plant would operate on the Krupp-Renn system, drawing on local ores.

Turkish copper ore production, which fell last year, shows signs of staging a recovery. The monthly average in 1956 and 1957 amounted to some 2,050 tonnes, but declined to 1,870 tonnes in 1958. Since January, however, production has risen, and this year's monthly average so far is 1,920 tonnes. In April, output totalled 2,114 tonnes.

Maria Cristina Chemical Industries has announced that it will shortly be starting production of ferro-alloys for the first time in the Philippines. These will include ferrosilicon, ferromanganese, and silicomanganese. Quartz, manganese and charcoal will be locally obtained.

Ten French mining students are to visit the Warwickshire coalfield from August 10-21. The visit is being made under the arrangements existing in the mining industry for the international exchange of mining students. During their stay in the Warwickshire coalfield the students will be the guests of the National Coal Board.

PERSONAL

The British South Africa Co. announces that Sir Charles C. G. Cumings ceased to be a director of the company and other concerns in its Group on July 31 and has been succeeded by Viscount Malvern as resident director in Africa on a non-executive basis. Mr. E. S. Newson and Mr. R. H. C. Boys have been appointed joint general managers in Africa of the Group.

Lieutenant Colonel G. A. Whitworth, having reached retiring age, will be relinquishing his appointment as Principal of the Camborne School of Metalliferous Mining on December 31, 1959.

Mr. I. M. Campbell Rodger, a director of De Beers Industrial Corporation, Ltd., died on August 2, 1959.



Machinery and Equipment

A Giant Among Crushers

The current tendency to increase the size of rock crushers as a direct attempt to minimize the costs of secondary blasting was illustrated recently when Pegson Ltd. displayed its new 60 in. by 48 in. crusher to the technical Press. Realizing that increased demands on the quarrying and metalliferous mining industries, together with the necessity of obtaining high outputs per man-hour of quarry or mine cost at the primary crushing station, have created this demand for high capacity primary crushers capable of handling large feed sizes, Pegson is now adding to its range of crushing equipment a number of mammoth-size crushers of which the 60 in. by 48 in. roller bearing primary jaw crusher is the largest to date. The machine is of complete U.K. design and manufacture; production outside the British Isles is not planned.

Weighing approximately 120 tons and standing 11 ft. high by 20 ft. long by 12 ft. wide, the crusher is capable of reducing the hardest stone and most ores, and has a capacity range of 300 tons to 500 tons per hr. according to the nature of the material being handled and the discharge setting required; the settings can be varied from 8 in. to 12 in.

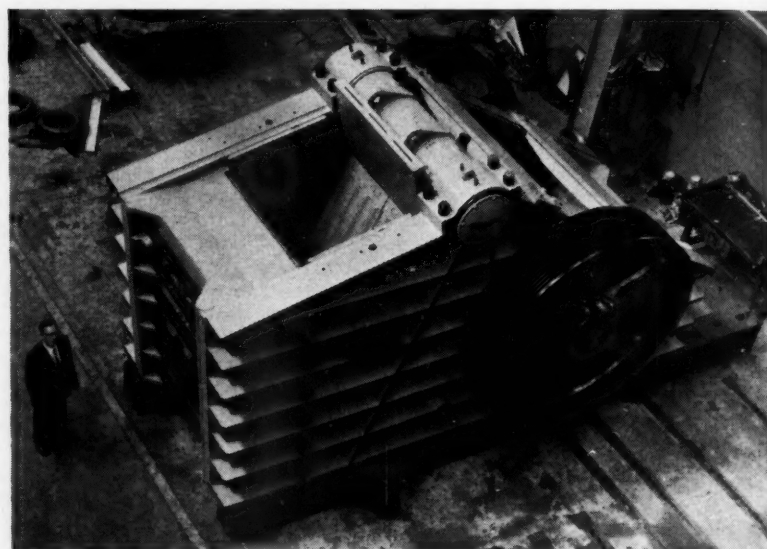
Particular features of the machine are its exceptional strength with roller bearing design, the hydraulic mechanism which gives speedy and easy adjustment of the jaw setting, the special shear-type toggle plate that fractures in an emergency, and down-thrust toggle seats which decrease the bearing load and require no lubrication.

The machine shown recently is being incorporated in the plant, designed and manufactured by Pegson, for phase one of the quarry reconstruction scheme at the Croft Granite Co. Ltd. An identical machine is on order for an Australian quarry.

ELECTROMAGNETIC INDUCTIVE ORE PROSPECTING

The ground prospecting equipment Turam 2S is the latest advance in the development programme of A. B. Elektrisk Malmletning, Sweden, since the company introduced the Turam method to mining geophysics in 1932. The method is claimed as being still the most effective and simple method of ore prospecting by the electromagnetic inductive method. Several notable ore deposits have been located with its help including, in recent years, valuable finds in Sweden, Portugal, and Africa. The high resolving power of the method makes it eminently suitable for prospecting for deep seated mineral deposits, and orebodies have been detected at depths of 200 metres. With the Turam method the geophysicist can locate conducting ore deposits even when these have the low conductivity typical of lead-zinc mineralisation, and can follow up electrically conducting ore-bearing formations including those that are represented only by horizons of very poor conductivity.

In common with other electromagnetic inductive systems the Turam method is based on the fact that a secondary current is induced in an electrical conductor



The new Pegson 60 in. by 48 in. crusher. Its size is apparent in relation to the man

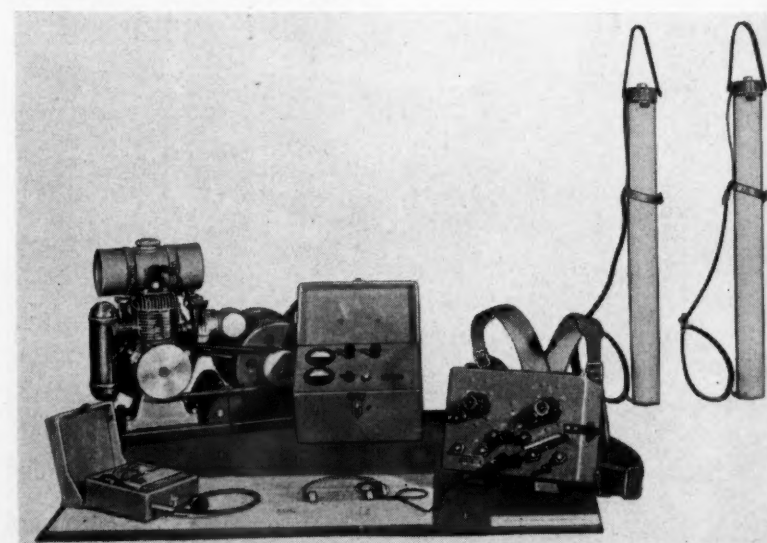
when the conductor is subjected to an alternating electromagnetic field. This secondary current creates its own electromagnetic field which, together with the primary applied field, produces a resultant electromagnetic field.

In the Turam method the primary alternating field is created by a current passing through a straight grounded cable or through a cable loop. The cable or cable loop is laid out on the ground parallel to the expected strike of the orebody and connected at some convenient point to a portable motor generator set. Measurements are made along observation lines at right angles to the cable layout with two receiver staffs (coils wound on

ferrite cores) connected to a compensator-amplifier unit. At each observation point the compensator-amplifier dials are adjusted until no signal is heard in a stethoscope headset; the two scales then show directly the phase difference and the amplitude ratio between the field components acting on the two receiver staffs.

The new development is forwarded as reliable, accurate and simple of operation. Compact design makes for easy carrying over difficult country. The equipment is tropicalized. It consists of compensator-amplifier unit, receiver staffs, connecting cables, primary cable and generator set.

The new Turam 2S prospecting equipment



Metals and Minerals

Rhodesian Concern Over Russo-American Barter Deal

The Government of the Central African Federation is to complain to the U.S. about the effect of the Russo-American chrome-for-steel barter deal on Rhodesian chrome exports, for which the U.S. is by far the largest market. As reported in our issue of July 17, p. 63, this deal involves the purchase of 350,000 tons of Soviet chrome ore by U.S. steel companies over the next four years in exchange for steel at an annual rate of 30,000 tons.

Mr. Frank Owen, Minister of Commerce and Industry, stated in Parliament that the Federal Government had been approached by Rhodesian chrome producers in regard to this deal. In reply to Mr. Robbie Williamson, of the Dominion Party, who expressed the view that the Federation might make barter deals on similar lines, the Minister said that the Federal Government deprecated this type of trading. In any case, he added, it would not be possible to exchange Rhodesian chrome for American steel, since the U.S. was short of steel at present and was importing from South Africa.

Meanwhile Russian competition continues, especially in the Scandinavian markets.

The West German economic news agency V.W.D. states that a chrome ore processing plant recently started in Rustenburg, Transvaal, will supply all the chrome ore demands of the West German Bayer A.G. chemical factories at Leverkusen and Ueberdingen, West Germany, and the Brazilian factory Belford Roxo der Bayer do Brasil Industrias Quimicas S.A. in Rio de Janeiro. Bayer A.G., a successor company of the I. G. Farben combine, is reported to have started the South African plant at a cost of £250,000.

CANADIAN URANIUM DELIVERIES

Deliveries of Canadian uranium oxide to the British Atomic Energy Authority and the U.S. Atomic Energy Commission totalled 3,468 l.tons in the second quarter of 1959. According to El Dorado Mining and Refining Ltd., the Federal uranium agency, the metal had a value of about \$70,660,000.

INDIA'S MICA EXPORTS

The desirability of banning the export of mica on a consignment basis is to be discussed by an all-India convention of mica dealers, which will shortly be held in Calcutta. The decision to hold such a convention was taken at the second annual general meeting of the Mica Export Promotion Council of India. A sub-committee has been appointed to work out details.

Mr. S. K. Sen, Joint Chief Controller of Imports and Exports, stressed the importance of maintaining the quality of mica exported from India. Urging the Association to consider measures such as pre-shipment inspection and a code of conduct to ensure that foreign buyers received mica according to specifications, he added that unless a flow of standard quality mica could be maintained, the trade might be adversely affected. Already some countries were searching for substitutes. Efforts should also be made to find a market for loose splittings.

NEW MAGNESIUM PLANT

It is reported from Chicago that the new primary magnesium plant of the Alabama Metallurgical Corporation, which has been under construction at Selma, Ala., is almost ready to begin initial operations with two furnaces. Hitherto the sole U.S. producer of primary magnesium for commercial purposes has been the Dow Chemical Co. A small tonnage is produced at a government-owned plant in Connecticut.

The start-up of the Alabama plant will mark the first real expansion of the magnesium producing industry. It is anticipated that commercial grade metal will be coming from the lines by September. Operations are expected to reach a level of 6,000 tons a year or more by 1960.

YUGOSLAV BARYTES CONTRACTS

A contract for the sale of 1,500 tonnes of ground barytes, to be delivered by the end of the year, was recently concluded between the foreign trade enterprise "Metalexport" of Sarajevo, Yugoslavia, and Polish importers. The sale of around 13,000 tonnes of this commodity on the foreign market has so far been assured this year.

The largest consignments of ground barytes in 1959 will be shipped to the U.S.S.R., Poland, Rumania, Egypt and Japan. Negotiations are also reported to be in progress for the sale of sizeable quantities of ground barytes on some Middle and Near East markets. Should these be successfully concluded, the largest Yugoslav producers of ground barytes, the Kresevo and Tarcin mills, will have to operate to full capacity. The mills are at present producing around 20,000 tonnes of ground barytes a year, but could increase their production to 35,000 tonnes without the need for any reconstruction or major investments.

Numerous contracts for the export of lump barytes had also been concluded by mid-June providing for a total of about 70,000 tonnes. Lump barytes has in the main been shipped to the U.S.A., France, the Federal Republic of Germany, Great Britain, and Austria. Yugoslav traders consider that the domestic mines will be able to provide exporters with about 100,000 tonnes of barytes of 92 per cent BaSO₄ and 4.25 minimum specific gravity quality this year.

MOLYBDENUM PRICE CUT

Climax Molybdenum Co., division of American Metal Climax Inc., has reduced its prices for "Climelt" hard-cast pure molybdenum metal and molybdenum base alloys by \$1.85 a lb. to \$8 a lb. The company states that these price cuts are the direct result of greater output plus the efficiency of its new plant at Coldwater, Michigan. This facility, designed for the production of molybdenum and molybdenum-base alloys, has now been in full operation for over six months.

It has been noted that the new price schedule also appears to provide the first official confirmation of the commercial availability of a molybdenum-base alloy with 30 per cent tungsten.

LONDON METAL AND ORE PRICES

The following price, as quoted on August 6, 1959, has changed during the past week:

Gold 249s. 9½d.

COPPER · TIN · LEAD · ZINC

There have been no developments during the past week to affect the general price structure and with the August Bank holiday intervening business has been on the quiet side.

The main interest in the copper market continues to be centred on the new labour contract negotiations in the U.S. where the latest developments include the calling of a strike by the United Steel Workers Union at the Phelps Dodge refinery at Laurel Hill. However, this Union has not struck at Kennecott's refinery where negotiations are still in progress. At a meeting of the Mine, Mill and Smelter Workers Union subjects discussed included the setting of a strike date and the general progress in the negotiations but so far there has been no further announcement. It is reported that the wage increase sought by this Union is in the region of 15c. an hour. European demand continues quiet whilst in the U.S. both producers at 30c. and customs smelters at 29½c. find business slow. At this point it is clear that strike action will have to be considerably more widespread before any sharp improvement in demand can be expected. In London a small backwardation has been maintained and last week stocks in L.M.E. official warehouses declined 382 tons to 14,966 tons.

Tin values have been well maintained with offerings of cash metal well absorbed although outside demand has been on the quiet side. On Thursday the Eastern price was £812½ and last week stocks rose 139 tons to 8,718 tons.

The zinc market continues to present a firm appearance and demand is very satisfactory particularly for high-grade metal although in the U.S. the steel strike has slowed down the offtake of prime western. Lead values have held up well and there is a noticeably better feeling towards this metal than for some time.

Closing prices up to midday, August 6, are as follows:

	July 30		Aug. 6	
	Buyers	Sellers	Buyers	Sellers
COPPER				
Cash	£224½	£225	£226½	£227½
Three months ..	£224½	£224½	£226½	£226½
Settlement ..		£225		£227½
Week's turnover	11,125 tons		7,300 tons	
LEAD				
Current ½ month	£69½	£70	£71½	£71½
Three months ..	£70½	£71	£72	£72½
Week's turnover	6,700 tons		5,275 tons	
TIN				
Cash	£792½	£793	£792½	£793
Three months ..	£789	£790	£790½	£791
Settlement ..		£793		£793
Week's turnover	875 tons		845 tons	
ZINC				
Current ½ month	£82	£82½	£83½	£84
Three months ..	£81	£81½	£82½	£82½
Week's turnover	6,250 tons		5,025 tons	

Mining Finance

Bumper July Kaffir Profits

The July returns from the South African gold and gold-uranium mines provided further impressive evidence of the way in which the profits of many of the new mines are expanding by, in some instances, leaps and bounds. That of Harmony, for instance, was no less than £56,000 higher at £476,325 compared with June, although this to some extent reflected a return to normal in uranium earnings after a June figure that was adversely affected by adjustments at the end of the company's financial year. Harmony's July profit is equivalent to an annual earnings rate of 5s. 9d. per 5s. share after allowing for loan repayments and interest. In these circumstances it will be surprising if, despite the continuing heavy capital expenditure, a further modest advance in the half-yearly dividend does not take place next month. For the year that ended in June, distributions totalled 2s. 1½d. a share.

Also outstanding in the July returns was that of President Brand, which followed up June's sharp advance with a further rise of £45,000 in combined gold and uranium profits to £889,598. Since February of this year Brand's monthly surplus has increased by no less than £243,000, a rise of 37 per cent. It brings the annual earnings rate as represented by the latest record profit to around 8s. 8d. per 5s. stock unit after allowing for estimated taxation. The 5s. per annum dividend is thus now not in the slightest danger despite the rising tide of taxation and Government's share of profits.

Other mines to show good profit increases last month included Free State Geduld, £31,000 up at £541,823, Western

Holdings, £22,000 up at £646,394, and St. Helena, £18,000 up at £278,604. All five of the O.F.S. mines mentioned in these notes are still some way from peak operational capacity. So further profit rises can be expected in coming months.

FREE STATE GEDULD BOREHOLE

Meanwhile, Free State Geduld has announced another borehole result. It is in the newly discovered area of richness to the south of the No. 1 shaft where a new shaft is to be sunk. It hit the Basal reef at a depth of 4,046 ft. and the core assayed 197 dwts. gold per ton over a true width of 5.28 inches equal to 1,040 inch-dwts. From a deflection another, but incomplete, reef section has been brought to the surface and at the time of writing is being assayed.

The value of the first core is high by normal standards, but low by comparison with what has gone before in this particular part of F.S. Geduld where 370 ft. sampled by the end of June from the 45 level in this region had given the huge values of 7,118 inch-dwts, while the original 215 ft. gave 9,772 inch-dwts. It was announced last March that this prospect borehole was being put down in order to obtain geological data prior to the sinking of the new ventilation and haulage shaft in this south-western corner of the mine.

ASHANTI'S RICH VALUES

Far away in Ghana, Ashanti Goldfields is doing its best not to be outdone by the Orange Free State. Last month this rich mine produced a 5 ounce per ton gold sample over a width of 6.8 ft. (not,

it is to be noted, inches) from the 14 south level of its Ayeinim property. Another interesting strike occurred on the 41 north, or bottom level, of the Main reef in the main Ashanti mine where the gold values in crosscut 38 west were 23.9 dwts over 20 ft. which if worked out on an inch-dwt. basis comes to 5,736 inch-dwts.

Ashanti's working profit before tax for the first ten months of its current financial year to September 30 next amounts to £1,309,911 against £1,088,088 at this time a year ago so there should be no doubt about the forecast 2s. dividend for 1958-59 being paid on the 4s. shares which stand at 18s. 0d. ex the interim of 1s. to yield 11.4 per cent.

NCHANGA'S SCRIP ISSUE

The Nchanga Consolidated Copper Mines results for the year to March 31 last and the surprise decision to make a free scrip issue of three £1 shares for every £1 stock unit held were discussed in our issue of July 10. Of main interest in the annual report is thus the statement by the chairman, Mr. Harry Oppenheimer. He reveals that the reasons behind the decision to quadruple the issued capital at £28,000,000 by the scrip issue are the conventional ones. Firstly, some £32,000,000 have been invested in this huge Northern Rhodesian mine so the proposed manœuvre will bring the capital more into line with that actually used in the business. Secondly, by reducing considerably the market price of the £1 units their market ability will be increased. The ex scrip equivalent of the current quotation of £12 2s. 6d. would be 60s. 7½d.

Nchanga's big expansion programme, begun in 1947, and which has included opening up the Nchanga and Chingola orebodies as open-pit operations, is now almost completed. Mr. Oppenheimer is thus able to say that, although there will again be large capital expenditure in the current financial year, the amount required under this heading should be reduced from next year onwards unless it is decided at a later stage to embark on either further projects or the opening up of additional orebodies. Although Nchanga is firmly entrenched as one of the great copper mines of the world, Mr. Oppenheimer thinks that its potential "has not yet by any means been fully determined". Prospecting at present in progress is expected to add considerably to the already huge ore reserves of 167,000,000 tons with an average copper content of 4.69 per cent.

In the year to March 31 last Nchanga produced a record 139,442 tons of copper despite the loss of nearly two months' output owing to the European labour strike. Sales were 129,024 tons at an average price of £204 a ton. The mine should thus be doing better still in the current year because since March the London copper price has fluctuated between £251 and £210 a ton and is now £226. It is doubtful whether Nchanga will produce materially less this year unless the copper situation deteriorates to an extent that makes more serious voluntary production cutbacks necessary than those already announced.

Mr. Oppenheimer considers that world consumption of copper will increase over the next few years and thinks that Nchanga's 1959-60 results will be "at least as successful" as those of last year. On the basis of the dividend of 12s. 6d. net of Rhodesian tax for that period Nchanga at 12½ yield 5.1 per cent before allowing for double tax relief.

LONDON MARKET HIGHLIGHTS

Friday's firm close in the Kaffir market was followed by a buoyant opening in London on Tuesday. Both New York and Johannesburg had been open for business on Bank Holiday Monday and the result of steady buying during that day in Johannesburg was that London prices had to be quickly marked up on Tuesday.

Much of the demand was again thought to originate in New York and with little stock available local dealers were often hard-pressed to supply the steady stream of orders. Among the Gold shares in particular demand were West Driefontein which spurted several shillings to a peak of 148s. 9d. by Wednesday evening.

The latest borehole news stimulated Free State Geduld (193s. 1½d.) and a concentration of investment orders lifted President Steyn 3s. 1½d. to 33s. 1½d. There was no very obvious motive behind the buying of Steyn and the mine's July profit return was colourless. Most of the other July returns were particularly good. That of President Brand, for instance, showed a fresh profit increase of no less than £45,180 to £889,598 and the shares accordingly advanced to 70s. 7½d.

Also outstanding was the best-ever £476,325 monthly profit announced by

Harmony, whose shares bounded ahead to 42s. 9d. on the news and most other O.F.S. issues improved as well.

In a generally firm Finance group, Gold Fields moved further ahead to 81s. 3d. and in their wake H. E. Proprietary (26s.) and New Union (11s. 6d.) showed useful rises. The Cape bid strongly for Rand Selection (58s. 6d.) and "Ofsits" which reached a new record price of 111s. Local investors were impressed with the good yield offered by "Johnnies" and the prospect of a resumption of income from the platinum interests this year. There was also some rather vague talk of a coming take-over for Wit Extensions which raised the shares by 1s. to 4s.

Other Mining sections were very much overshadowed by the strength of Kaffirs. In Diamonds, De Beers (174s. 4½d.) were persistently bought. But Coppers, Tins and Lead-zincs were out of the picture for most of the time. Nchanga eased to 12½ in front of the full report while Bancroft staged an overdue recovery to 24s. 3d. Geevor (20s.) regained 1s. of the 4s. 6d. capital return and with a dividend due any day now the shares look to be attractive; so do Ashanti, ex-dividend at 18s.

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COMPANY NEWS

Arising from the diversification of its interests, and activities, Cambrian Wagon and Engineering Co. Ltd., a subsidiary of Powell Duffryn, Ltd., has, with effect from July 29, changed its name to Powell Duffryn Engineering Co. Ltd. At the same time, the name "Cambrian" will be retained both as a trade name and in the address of the company, which will now be: Cambrian Works, Maindy, Cardiff. Tel.: Cardiff 29611.

The Dow Chemical Co. has formed a new division for the fabrication and semi-fabrication of magnesium, aluminium and other metals. The division, to be known as the Dow Metal Products Co., replaces the Dow Magnesium Products Department.

Mr. Peter Allan has been appointed a director and general manager of F. Perkins (Canada) Ltd., Toronto, Canadian subsidiary of the Peterborough diesel engine company.

A two-day Sales Conference was held in London on July 13 and 14 by the well-known safety equipment firm of Pyrene-Panorama Ltd., of Windmill Road, Brentford. This company was formerly Panorama Equipment Ltd., but is now a wholly-owned subsidiary of the Pyrene Co. Ltd.

COMING EVENTS

The IIIrd International Congress on the Prevention of Occupational Risks is to be organised by the French National Safety Institute, under the patronage of the International Social Security Association, in co-operation with the International Labour Office, and will be held at Paris in 1961.

A paper by J. N. Woodley, entitled "Pumping Methods and Problems", will be presented to the North of England Institute of Mining and Mechanical Engineers at a meeting to be held on October 10, 1959, at 2.30 p.m.

The 9th Electrical Engineers Exhibition sponsored by the Association of Supervising Electrical Engineers will be held at Earls Court, London, from April 5-9, 1960.

The annual meeting of the British Association for the Advancement of Science will be held in York on September 2-9, 1959.

A special feature of the 1959 Convention of the American Mining Congress, to be held in Denver from September 14-16, will be a review and discussion of U.S. national mineral policies, in which officials from both the Executive and Legislative branches of the Government will participate.

MINING ENGINEER, aged 30-40 required for alluvial mining in West Africa. Please apply, giving particulars of age, qualifications, experience and copies of references to Box No. 639, The Mining Journal Ltd., 15 Wilson Street, London, E.C.2.

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